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| 31780 | 7590 | 07/02/2008 | EXAMINER | |
| ERIC ROBINSON | | | NGO, HUYEN LE | |
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| 21010 SOUTHBANK ST. | | | PAPER NUMBER | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/728,932

Applicant(s)

KONUMA, TOSHIMITSU

Examiner

Julie-Huyen L. Ngo

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/02)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 9, 2009 has been entered.

Response to Arguments

Applicant's arguments filed on May 9, 2008 with respect to claims 6-30 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-22 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 6, 12 and 17, the recitation calling for "*said orientation films have a surface tension of 40 dyne/cm or more, wherein spacing between said substrates is less than 3.5µm...*" is indefinite and indeterminate in scope, since the recitation of *40 dyne/cm or more* is open-ended, i.e., it has no upper limit; and the recitation of *less*

than 3.5 μm ” has no lower limit. Furthermore, this limitation is broader than the scope of enablement since it would read on at least one value (i.e., zero) that would be inoperative.

Claims that are depended from the above-rejected claims and are not specifically discussed above are rejected as bearing the defects of the claims from which they depend.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 23, 26-28 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Patel et al. (US 5040876 A).

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Patel et al. teach (Col. 2, line 48 - Col. 4, line 13 and Figure 1) forming a display device comprising:

Claim 23:

- a pair of substrates (22 & 24);
- one liquid crystal layer (38) provided between said pair of substrates and comprising a nematic liquid crystal; and
- orientation films having antiparallel orientation directions to each other, wherein each of the pair of substrates is provided with only one of the orientation films, and wherein the one liquid crystal layer is in contact with each of the orientation films (34 & 36).

Claim 26:

- a first electrode (25-28) provided on one of said substrates; and a second electrode (29-31) provided on the other of said substrates

Claim 27:

- said nematic liquid crystal has a positive dielectric anisotropy

Claim 28:

- said orientation directions are rubbing directions

Claim 30:

- almost all liquid crystal molecules of the liquid crystal layer are substantially aligned in one direction.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (US 5040876 A) as applied to claim 23, and further in view of Nishikawa et al (US 5276132 A) and Holmes et al. (US 4965017 A).

The display device disclosed by Patel et al as applied to claim 23 fails to disclose that each of said orientation films comprises polyimide.

However, it is well known and conventional in the art to have orientation films formed of polyimide for providing a molecular alignment of the liquid crystal molecules along a rubbing direction and for having a small tilt bias angle (e.g. 0.5 degree to 2 degrees), as evidenced by Holmes et al. (col. 1, lines 44-52) and Nishikawa et al. (col. 1, lines 15-27). Such alignment layers are suitably employed in 90 degrees twisted nematic displays.

Therefore, it would have been obvious for one having ordinary skill in the art to have the orientation films comprised of polyimide in Patel et al display device for providing a molecular alignment of the liquid crystal molecules along a rubbing direction and for having a small tilt bias angle of between 0.5 degree and 2 degrees, as taught by Holmes et al. (col. 1, lines 44-52) and Nishikawa et al.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (US 5040876 A) as applied to claim 23 above, and further in view of Amstutz et al (US 4697884 A).

The display device disclosed by Patel et al as applied to claim 23 fails to disclose that the display device is a reflection-type display device.

It is well known and conventional in the art for a display device to be formed as a reflective-type display device by having a reflection layer formed on surface of lower substrate for reflecting ambient light, as evidenced by Amstutz et al with a reflector 12 formed on a side of the display as shown in fig. 1. Doing so would reduce power consumption and having a brighter display.

Therefore, it would have been obvious for one having ordinary skill in the art to a reflection layer on a surface of the lower substrate in Patel et al display for reflecting ambient light, as taught by Amstutz et al. Doing so would reduce power consumption and having a brighter display.

Claims 6, 9-12, 17-22 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (US 5040876 A) and further in view of Ohkubo et al. (US4878742) and Kanemoto et al. (US5250214A).

Claims 6, 12 and 17:

Patel et al. teach (Col. 2, line 48 - Col. 4, line 13 and Figure 1) forming a display device comprising:

- a pair of substrates (22 &24);

- one liquid crystal layer (38) provided between said pair of substrates and comprising a nematic liquid crystal;
- a pair of orientation films (34 & 36) provided adjacent to and between said pair of substrates respectively, and having antiparallel orientation directions to each other,

wherein the one liquid crystal layer is in contact with each of the orientation films and each of the pair of substrates is provided with only one of the orientation films.

Claims 9, 15 and 20:

- a first electrode (25-28) provided on one of said substrates; and a second electrode (29-31) provided on the other of said substrates

Claims 10, 16 and 21:

- said nematic liquid crystal has a positive dielectric anisotropy

Claims 11 and 22:

- said orientation directions are rubbing direction

Claims 12 and 29:

- said liquid crystal comprising molecules aligned substantially in one direction throughout a thickness of said one liquid crystal layer

However, Patel et al fail to teach that the orientation films have a surface tension of 40 dyne/cm or more, and the space between said substrates is less than 3.5 μm .

Ohkubo et al. teach forming spacing between two substrates of less than 3.5 μm for extinguishing diffraction without disturbance (col. 9 lines 23-27).

Kanemoto et al. teach (col. 26, lines 53-64) forming the orientation film with a surface tension of not smaller than 40 dyne/cm for spreading the LC polymer in its LC phase uniformly on a coated surface of an orientation film.

Therefore, it would have been obvious for one having ordinary skill in the art to modify Patel display device with a spacing between the substrates of less than 3.5 μm for extinguishing diffraction without disturbance (col. 9 lines 23-27), as Ohkubo et al. taught; and with the orientation films having a surface tension of 40 dyne/cm or more for spreading the LC polymer in its LC phase uniformly on a coated surface of the orientation films, as taught by Kanemoto et al.

Claims 7, 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (US 5040876 A) in view of Ohkubo et al. (US4878742) and Kanemoto et al. (US5250214A) as applied to claims 6, 12 and 17 above, and further in view of Nishikawa et al (US 5276132 A) and Holmes et al. (US 4965017 A).

The display device disclosed by Patel et al in view of Ohkubo et al. and Kanemoto et al. fails to disclose that each of said orientation films comprises polyimide.

However, it is well known and conventional in the art to have orientation films formed of polyimide for providing a molecular alignment of the liquid crystal molecules along a rubbing direction and for having a small tilt bias angle of between 0.5 degree and 2 degrees. Such alignment layers are suitably employed in 90 degrees twisted nematic displays, as evidenced by Holmes et al. (col. 1, lines 44-52) and Nishikawa et al. (col. 1, lines 15-27).

Therefore, it would have been obvious for one having ordinary skill in the art to have the orientation films comprised of polyimide in Patel et al in view of Ohkubo et al. and Kanemoto et al. display device for providing a molecular alignment of the liquid crystal molecules along a rubbing direction and for having a small tilt bias angle of between 0.5 degree and 2 degrees, which is suitable for use in a 90 degrees twisted nematic display, as evidenced by Holmes et al. (col. 1, lines 44-52) and Nishikawa et al. (col. 1, lines 15-27).

Claims 8, 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (US 5040876 A) in view of Ohkubo et al. (US4878742) and Kanemoto et al. (US5250214A) as applied to claims 6, 12 and 17 above, and further in view of Amstutz et al (US 4697884 A).

The display device disclosed by Patel et al in view of Ohkubo et al. and Kanemoto et al. fails to disclose that the display device is a reflection-type display device.

However, it is well known and conventional in the art for a display device to be formed as a reflective-type display device by having a reflection layer formed on surface of lower substrate for reflecting ambient light, as evidenced by Amstutz et al with a reflector 12 formed on a side of the display as shown in Fig. 1. Doing so would reduce power consumption and having a brighter display.

Therefore, it would have been obvious for one having ordinary skill in the art to form a reflection layer on a surface of the lower substrate in Patel et al in view of

Ohkubo et al. and Kanemoto et al. display device for reflecting ambient light. Doing so would reduce power consumption and having a brighter display, as taught by Amstutz et al.

Conclusion

Tokihiko Shinomiya (US 5202779 A) disclose a ferroelectric liquid crystal display device with polyimide orientation film of bis (4-aminocyclohexyl) methane and aromatic tetracarboxylic acid anhydride to improve a display device in its contrast.

Anthony B. Davey (US 5124827 A) disclose a ferroelectric liquid crystal cell using polyimide alignment layers having antiparallel arrangement that gives rise to a splay in directions of molecular alignment tends to produce a better alignment of the smectic layers. Memory properties were reported as being improved by the substantial elimination of relaxation effects.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (571) 272-2295. The examiner can normally be reached on M-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julie-Huyen L. Ngo/
Primary Examiner
Art Unit 2871